

Application No.: 10/658106
Amendment dated: September 22, 2005
Reply to Office action of: June 22, 2005

REMARKS/ARGUMENTS

The invention is characterized by the collection of hydrogen gas evolved autonomously when cracks, initiated in metal particles by mechanical action, are propagated by the products of reaction between water and newly exposed metal surfaces.

New independent claim 9 defines the invention, and distinguishes it from the prior art by reciting the steps of:

- (a) submerging metal,
- (b) mechanically generating particles from the metal,
causing
 - (i) production of microscopic cracks in the surfaces
of the particles, and
 - (ii) evolution of hydrogen gas from the cracks,
- (c) allowing reaction products to cause
 - (i) self-propagation of the cracks, and
 - (ii) continued autonomous evolution of hydrogen gas
from within the cracks; and
- (d) collecting the autonomously evolved hydrogen gas.

According to Uehara, when the grinding process is stopped, the production of hydrogen gas is suspended automatically. (See Uehara paragraph 0021.) Therefore, apparently Uehara did not appreciate that autonomous production of hydrogen would occur. Furthermore Uehara makes a point that it is desirable to remove suspended matter by circulating water with a pump. (Uehara paragraph 0031) This indicates that Uehara is relying on generation of hydrogen at the surface of the block being ground, and is not waiting for

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autonomous generation of hydrogen to occur within the particles.

In short, the present inventors are collecting hydrogen generated autonomously after a time, whereas Uehara et al. are discarding the particles before autonomous generation has a chance to occur.

The dependent claims add some further limitations not suggested by Uehara. Among these are:

The 50 μm grain size limitation of claims 10 and 20;

The use of pure water, substantially free of ionic impurities and organic molecules, as in claims 11 and 21;

Collecting the autonomously produced hydrogen gas throughout a time interval including the time at which the hydrogen production rate reaches a maximum, as in claim 12;

The use of cutting chips, as in claim 15;

Collecting hydrogen at a time at least approximately 40 hours after the particles are generated, as in claim 16;

Collecting hydrogen until the particles collapse, as in claim 17; and

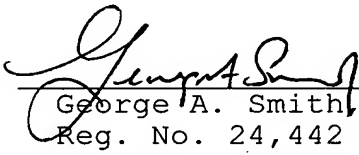
Collecting hydrogen until the interior of the particles is converted to aluminum oxide, as in claim 18.

For the above reasons, we submit that the claims as presently presented clearly distinguish the invention from Uehara, and that the invention as claimed is not shown by Uehara to have been obvious.

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The applicants respectfully request favorable
reconsideration and allowance of their application.

Respectfully submitted,
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